

10-06-05

ITW
AF/81

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant(s): Gary Zyhowski et al.

Serial No.: 10/790,303

Filed: March 1, 2004

For: **FLUORINATED KETONE AND FLUORINATED ETHERS AS
WORKING FLUIDS FOR THERMAL ENERGY CONVERSION**

Examiner: H. M. Nguyen

Art Unit: 3748

Customer No.: 27623

Attorney Docket: H0005587

Mail Stop Appeal Brief-Patents
COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

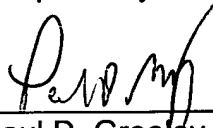
We are enclosing for filing in the above-identified application the following:

1. Appellant's Appeal Brief (*in triplicate*);
2. Firm Check for \$500.00;
3. Transmittal letter in duplicate; and
4. Postcard.

Please charge any additional fees or credit any such fees, if necessary to Deposit Account No. **01-0467** in the name of Ohlandt, Greeley, Ruggiero & Perle. A duplicate copy of this sheet is attached.

Respectfully submitted,

Dated: October 5, 2005



Paul D. Greeley, Esq.
Registration No. 31,019
Ohlandt, Greeley, Ruggiero & Perle, L.L.P.
One Landmark Square, 10th Floor
Stamford, CT 06901-2682
Telephone: (203) 327-4500

CERTIFICATE OF EXPRESS MAILING

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" Certificate No. **EV 685785674 US**, service under 37 CFR §1.10 and is addressed to: Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on October 5, 2005.



Theresa Doonan

10/5/05

DATE



Docket: H0005587

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES**

Applicants/Appellants: Gary Zyhowski et al.

Serial No.: 10/790,303

Group No.: 3748

Filing Date: March 1, 2004

Examiner: H.M. Nguyen

Title: FLUORINATED KETONE AND FLUORINATED ETHERS AS
WORKING FLUIDS FOR THERMAL ENERGY CONVERSION

Mail Stop: Appeal Brief-Patent
Commissioner for Patents
Alexandria, VA 22313-1450

APPEAL BRIEF TRANSMITTAL LETTER

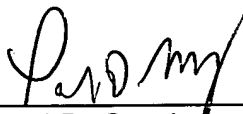
Dear Sir:

Attached hereto is Appellants' Appeal Brief, in triplicate, and a check in the amount of \$500.00 to cover the requisite fee under 37 CFR 1.17(f) for filing said Brief in furtherance of the Notice of Appeal filed in this Application.

Respectfully submitted,

OHLANDT, GREELEY, RUGGIERO & PERLE, L.L.P.

By:



Paul D. Greeley
Reg. No. 31,019

One Landmark Square, Tenth Floor
Stamford, CT 06901-2682
Tel.: (203) 327-4500
Fax: (203) 327-6401
Date: October 5, 2005



Docket: H0005587

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES**

Applicants/Appellants: Gary Zyhowski et al.

Serial No.: 10/790,303

Group No.: 3748

Filing Date: March 1, 2004

Examiner: H. M. Nguyen

Title: FLUORINATED KETONE AND FLUORINATED ETHERS AS
WORKING FLUIDS FOR THERMAL ENERGY CONVERSION

**Mail Stop: Appeal Brief-Patent
Commissioner for Patents
Alexandria, VA 22313-1450**

APPELLANT'S APPEAL BRIEF

Dear Sir:

This is an appeal from the Final Rejection of Claims 1 to 19 by the Primary Examiner in Group Art Unit 3748 on March 22, 2005.

Jurisdiction of this appeal results in the Board of Patent Appeals and Interferences under the provisions of Section 134, Title 35, United States Code, by way of a Notice of Appeal and requisite fee mailed to the USPTO with Certificate of Mailing on August 5, 2005.

10/11/2005 BABRAHA1 00000040 10790303

01 FC:1402

500.00 OP

TABLE OF CONTENTS

Table of Authorities.....	3
Real Party in Interest.....	4
Related appeal and Interferences.....	4
Status of Claims.....	4
Status of Amendments filed Subsequent to Final Rejection.....	4
Summary of the Invention.....	4
Issues.....	6
Grouping of the Claims.....	6
Arguments.....	7
PTO Position.....	7
35 U.S.C. 112, first paragraph, rejection.....	7
35 U.S.C. 102(b) rejection	7
35 U.S.C. 103(a) rejection.....	8
Applicant's Argument 1	
The USPTO's contention that the phrase "not fully halogenated"	
in claims 1, 7 and 14 is not found in the specification and is a	
proper basis for rejecting claims 1-19 under 35 U.S.C. 112, first	
paragraph, is both legally and factually erroneous. The USPTO	
is erroneously looking for ipasis verbis support for the phrase.....	8
Applicant's Argument 2	
The 35 U.S.C. 102(b) rejection of claims 1, 7 and 14	
as anticipated by Drakesmith et al. is factually erroneous	
since the patent discloses no working fluids within the	
scope of Applicant's claims 1, 7 and 14.....	10
Applicant's Argument 3	
No proper legal of factual basis has been given by the	
USPTO to support an obviousness rejection under	
35 U.S.C. 103 of Applicant's claims 2-6, 8-13 and 15-19.....	12
Prayer for Relief.....	14
Claims on Appeal.....	Appendix

TABLE OF AUTHORITIES

<u>Decision</u>	<u>Page</u>
<i>Ralston Purina Co. v. Far-Mar-Co, Inc.</i> , 772 F.2d 1570, 227 USPQ 177 (Fed Cir. 1985) ...	8
<i>In re Kaslow</i> , 707 F.2d 1366, 217 USPQ 1089 (Fed. Cir. 1893).....	8
<i>In re O'Farrel</i> , 853 F.2d 894, 7 USPQ2d 1673 (Fed. Cir. 1988).....	12
<i>In re Papesch</i> , 315 F.2d 381, 137 USPQ 43, 50 (CCPA 1963).....	13
<i>In re Vaeck</i> , 947 F,2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).....	12
<i>In re Wright</i> , 866 F.2d 422, 9 USPQ2d 1649,1651 (Fed. Cir. 1989).....	9

(1) **REAL PARTY IN INTEREST**

The real party in interest for this application is Honeywell Inc.

(2) **RELATED APPEALS AND INTERFERENCES**

There are no related appeals or interferences.

(3) **STATUS OF CLAIMS**

- (a) Claims canceled: None;
- (b) Claims withdrawn from consideration: None;
- (c) Claims pending: Claims 1-19;
- (d) Claims allowed: None;
- (e) Claims rejected: Claims 1-19; and
- (f) Claims on appeal: Claims 1-19.

(4) **STATUS OF AMENDMENTS FILED SUBSEQUENT TO FINAL REJECTION**

No amendments were filed subsequent to the final rejection. The claims under appeal are those in the application on March 22, 2005.

(5) **SUMMARY OF THE INVENTION**

The claimed invention relates to a process for converting thermal energy to mechanical energy in a Rankine cycle or a similar power cycle, such as by repeating the steps of: vaporizing a working fluid with a heat source, expanding the resulting vapor and then cooling with a cold heat source to condense the vapor and pressurizing the working fluid. Claim 1 is exemplary of the invention. The conversion steps of the process are not of themselves novel and are a known way of

converting thermal energy to mechanical energy, such as in a Rankine cycle. The novelty and inventiveness of the claimed process reside in the working fluid(s) employed in the process. In accordance with the claimed invention the working fluid employed in the process is a member selected from polyfluorinated ethers, polyfluorinated ketones and mixtures thereof, and wherein the polyfluorinated ethers are not fully halogenated (**claims 1, 7, 13 and 14**), more specifically those selected from the following polyfluorinated ethers, polyfluorinated ketones and mixtures thereof: methyl (trifluoroethyl) ether ($\text{CH}_3\text{OCH}_2\text{CF}_3$), methyl (heptafluoropropyl) ether ($\text{CH}_3\text{OCF}_2\text{CHFCF}_3$), di(trifluoroethyl) ether ($\text{CF}_3\text{CH}_2\text{OCH}_2\text{CF}_3$), methyl (hexafluoropropyl) ether ($\text{CH}_3\text{OCF}_2\text{CF}_2\text{CHF}_2$), methyl (pentafluoropropyl) ether ($\text{CH}_3\text{OCH}_2\text{CF}_2\text{CF}_3$), methyl (perfluorobutyl) ether ($\text{C}_4\text{F}_9\text{OCH}_3$), ethyl (perfluorobutyl) ether ($\text{C}_4\text{F}_9\text{OC}_2\text{H}_5$), methyl (perfluoromethyl) ketone (CF_3COCH_3), perfluoromethyl (trifluoroethyl) ketone ($\text{CF}_3\text{CH}_2\text{COCF}_3$), methyl (perfluoroethyl) ketone ($\text{C}_2\text{F}_5\text{COCH}_3$), methyl (perfluoropropyl) ketone ($\text{F}_3\text{CF}_2\text{CF}_2\text{COCH}_3$), perfluoroethyl (perfluoropropyl) ketone ($\text{CF}_3\text{CF}_2\text{CF}_2\text{COC}_2\text{F}_5$), methyl (octafluorobutyl) ketone ($\text{C}_2\text{F}_5\text{CFHCF}_2\text{COCH}_3$), di(perfluoropropyl) ketone ($\text{CF}_3\text{CF}_2\text{CF}_2\text{COCF}_2\text{CF}_2\text{CF}_3$), and mixtures thereof (**Claims 2, 8 and 15**), and even more specifically limited to a polyfluorinated ether, polyfluorinated ketone and mixtures thereof selected from methyl (perfluoropropyl) ether, methyl (perfluorobutyl) ether, perfluoroethyl perfluoroisopropyl ketone and mixtures thereof (**Claims 3-6, 9-12, and 16-19**).

The use of these polyfluorinated ethers, polyfluorinated ketones and mixtures thereof, wherein the polyfluorinated ethers are not fully halogenated, in the process is novel and provides patentable advantages over CFC's (chlorofluorocarbons) and HCFC's (hydrochlorofluorocarbons) previously employed for this type of conversion process. The polyfluorinated ethers, polyfluorinated ketones and mixtures thereof employed as working fluids in the presently claimed invention, in addition to being environmentally safe substitutes for the environmentally damaging CFC's and HCFC's, also provide low life cycle climate change potential and low global warming potential, improved heat capacity and thus higher cycle efficiency, as well as high liquid heat capacity, lower heat-to heat capacity ratio, high critical temperature and

high thermal stability in addition to low toxicity and improved flammability properties. Moreover, the polyfluorinated ethers, polyfluorinated ketones and mixtures thereof used in the process of this invention would not require major engineering changes to conventional technology currently used with CFC and/or HCFC working fluids, and are compatible with currently used and/or available material of construction used in the process equipment.

(6) **ISSUES**

The following issues are presented for appellate determination by this appeal:

- (a) the rejection of claims 1-19 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement;
- (b) the rejection of claims 1, 7 and 14 under 35 U.S.C. 102 (b) as being anticipated by the disclosure in US Patent 4,736,045 to Drakesmith et al.; and
- (c) the rejection of claims 2-6, 8-13 and 15-19 under 35 U.S.C. 103 (a) as being unpatentable (obvious) over the disclosure in US Patent 4,736,045 to Drakesmith et al.

(7) **GROUPING OF THE CLAIMS**

Claims 1, 7, 13 and 14 stand or fall together;
Claims 2, 8 and 15 stand or fall together;
Claims 3, 9 and 16 stand or fall together;
Claims 4, 10 and 17 stand or fall together;
Claims 5, 11 and 18 stand or fall together; and
Claims 6, 12 and 19 stand or fall together.

(8) **ARGUMENTS**

PTO'S POSITION

(a) 35 U.S.C. 112, first paragraph,

With respect to the 35 U.S.C. 112, first paragraph , rejection of claims 1-19, the USPTO contends that the "claim(s) contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention" . This contention of the USPTO is based on the presence in claims 1, 7 and 14 of the phrase "not fully halogenated" (added to claims 1, 7 and 14 in the January 2005 Amendment Response), The USPTO contends this phrase is not found in the specification--- see Final Rejection, paragraph bridging pages 2 and 3 and the first full paragraph on page 3. The PTO contends that Applicant cannot rely upon what some statement in the specification was "meant" to mean and that the PTO failed to find the phrase "not fully halogenated hydrocarbon" in the specification—see USPTO Advisory Action of May 26, 2005, page 2, first full paragraph. The PTO further contends that this phrase can be given "very little weight" in determining patentability for apparatus claims because they are product-by-process limitations"—Advisory action , page 3.

(b) 35 U.S.C. 102(b) rejection

The sole contention of the USPTO in the Final Rejection with respect to support for the 35 U.S.C. 102(b) rejection of claims 1, 7 and 14 for lack of novelty over the disclosure in the Drakesmith et al patent (US 4,736,045) is that "Drakesmith et al discloses a Rankine cycle using organic fluid which may be butyl methyl ether or other similar working fluid (note column 15, lines 45-68)"---see final rejection, page 3, fifth full paragraph. In the Advisory Action of May 26, 2005, in the last paragraph on page 2 thereof, the USPTO contends that Drakesmith et al. discloses partially halogenated compounds at column 1, lines 11-12.

(c) 35 U.S.C. 103(a) rejection

The USPTO's position for the rejection of claims 2-6, 8-13 and 15-19 for obviousness under 35 U.S.C. 103 is that although the Drakesmith et al. Patent "does not different types of organic fluids as claimed", the USPTO takes "**Official Notice**" that "changing working fluids is well known in the art. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to select different types of organic fluids as claimed in the system of Drakesmith et al for the purpose of achieving appropriate work outputs based on the special characteristics of the fluid"---see final rejection , page 4, first paragraph.

APPLICANT'S ARGUMENT 1

The USPTO's contention that the phrase "not fully halogenated" in claims 1, 7 and 14 is not found in the specification and is a proper basis for rejecting claims 1-19 under 35 U.S.C. 112, first paragraph, is both legally and factually erroneous. The USPTO is erroneously looking for *ipsis verbis* support for the phrase.

It is well established law that an *ipsis verbis* disclosure is not required to satisfy the written description requirement of Section 112. Rather than the presence or absence of *ipsis verbis* support, the proper legal test for claim support under the first paragraph of section 112 is whether the disclosure, as originally filed, reasonably conveys to the skilled person in the art that the inventor had possession, at that time, of the subject matter claimed. *Ralston Purina Co. v. Far-Mar-Co, Inc.*, 772 F.2d 1570, 227 USPQ 177 (Fed Cir. 1985); *In re Kaslow*, 707 F.2d 1366, 217 USPQ 1089 (Fed. Cir. 1893). If the essence of the original specification supports the claimed language the language added is not new matter and a rejection under 35 U.S.C. 112, first paragraph is legally erroneous. *In*

re Wright, 866 F.2d 422, 9 USPQ2d 1649,1651 (Fed. Cir. 1989). Thus, the USPTO has not employed the proper legal standard in determining whether the rejection is proper.

When the above set forth proper legal standard is employed, it is clear that the original disclosure in Applicant's specification establishes that Applicant had possession of this concept, and in fact Applicant disclosed this concept in a corollary statement that is equivalent to *ipsis verbis* support for the phrase "not fully halogenated". In describing the polyfluorinated ethers, polyfluorinated ketones and mixtures thereof as the working fluids for the process of this invention Applicant's specification, at paragraph [0008], page 5, lines 12-16, states the following corollary statement, i.e., that the polyfluorinated compounds of the invention are distinguished from the prior art compounds in that the compounds of the invention have certain advantageous properties **"in comparison to the fully halogenated hydrocarbons"** (emphasis added). This statement can only mean that the polyfluorinated ether compounds of this invention are "not fully halogenated" and thus clearly established that the inventors conveyed to the skilled person in the art that the inventor had possession, at that time, of the subject matter claimed. Moreover, the named compounds in the disclosure are not fully halogenated in contrast to those of the prior art. Thus, the claimed language "not full halogenated" is factually supported in the specification in a manner that complies with the legal requirement for disclosure under 35 U.S.C. 112, first paragraph. Therefore, it is readily apparent that the USPTO position is both legally and factually erroneous and the Section 112 rejection of claims 1-19 is erroneous since the specification, as filed, reasonably conveys to the skilled person in the art that the inventors had possession, at that time, of the subject matter claimed. Therefore, the Section 112 rejection of the claims must be reversed.

Additionally, since specific compounds are recited as the working compounds in claims 2-6, 8-12 and 15-19, this rejection has no relevance to those claims and is erroneous for that additional reason with respect to said claims 2-5, 8-12 and 15-19.

Claims 14-19 are binary cycle process claims, not apparatus claims as erroneously contended. Thus, the recitation of the working fluid compounds in the claims are in fact positive specific limitations, contrary to the erroneous contention of the USPTO.

APPLICANT'S ARGUMENT 2

The 35 U.S.C. 102(b) rejection of claims 1, 7 and 14 as anticipated by Drakesmith et al. is factually erroneous since the patent discloses no working fluids within the scope of applicant's claims 1, 7 and 14.

The USPTO erroneously contends that claims 1, 7 and 14 are anticipated by the disclosure in Drakesmith et al. of butyl methyl ether or other similar working fluids at column 15, lines 45-68 in a Rankine cycle process. Butyl methyl ether is a **NOT a polyfluorinated** ether, has no close relationship to polyfluorinated ethers, and is **NOT** a working fluid within the scope of claims 1, 7 and 14 which requires the ethers to be polyfluorinated.

The compounds that are the working fluids are **limited** to those specific polyfluorinated ethers compounds disclosed in Drakesmith et al. at column 2, lines 39-65 and those compounds **are fully halogenated ethers** –see particularly lines 63 to 65. Such fully halogenated ethers are not within the scope of claims 1, 7 and 14. Additionally, Drakesmith et al. discloses no other polyfluorinated **ketone** compounds (the other working fluid compounds of Applicant's claims) as Rankine cycle working fluids. Thus, Drakesmith does anticipate any of claims 1, 7 or 14 and the rejection cannot be sustained.

The USPTO recognizes that the fully halogenated ethers of Drakesmith et al. **(that are the only ethers of the Drakesmith et al. invention for use in Rankine cycle processes)** does **not** meet Applicant's claimed compounds of "not fully halogenated polyfluorinated ethers". Attempting to meet this deficiency in the reference disclosure the

USPTO erroneously relies upon the disclosure at column 1, lines 11-12 of Drakesmith et al. to contend that the patentees contemplate partially halogenated ethers. This reliance upon the disclosure at column 1, lines 11-12 is taken out of context and is an erroneous misconstruction of the disclosure in Drakesmith et al. It is very clear from all the remaining disclosure in Drakesmith et al. that the only ethers they contemplate for use in a Rankine cycle process are the fully halogenated ethers disclosed at column 1, lines 39 to 65. The disclosure at column 1, lines 11-12 is merely a recognition by Drakesmith et al. that the fluorination process used to produce such ethers may, if not properly conducted, result in partial or fully fluorinated species. Column. 2, lines 40-44 of that patent make it clear that 440°C reaction temperature results in fully fluorinated species while lower temperatures akin to 200°C will result in partially fluorinated species.

Moreover, reading the rest of the patent confirms this. Column 1, lines 45-65, and column 2, lines 53-57 describe production of only fully fluorinated species as do the entirety of columns 3 and 4. Moreover, column, 4 lines 38-43, essentially serve as an alert that if temperature is too low, no fully fluorinated species are obtained. Note that in the last two lines of column 4, the higher temperature results in an “excellent yield” of fully fluorinated adduct. The tag “excellent yield” is assigned to the fully fluorinated adduct because it is the desired result. Table 1 illustrates the temperature dependence of the fluorination. It becomes clear by reviewing Examples 1-4 and the accompanying tables that the objective of the patent is to obtain fully fluorinated species. All the examples describe a reaction step at a temperature of 440°C for that specific purpose. Moreover, the patent nowhere discloses production of any polyfluorinated ethers that are not fully halogenated. This is precisely in line with the disclosure at column 2, lines 39-65 that the ethers of their invention for use in Rankine cycles are the fully fluorinated ethers disclosed at that portion of the patent. The USPTO extrapolated position is thus against and completely contrary to this clear context of the patent disclosure. Therefore, it is clear that the Drakesmith et al. patent discloses “not fully halogenated polyfluorinated ethers” for use in a Rankine cycle process. Thus, the disclosure in Drakesmith et al. does not and cannot anticipate Applicant’s claims 1, 7 or 14 and, therefore, the 35 U.S.C. 102(b) rejection of those claims over this patent is clearly erroneous and cannot be sustained.

APPLICANT'S ARGUMENT 3

No proper legal or factual basis has been given by the USPTO to support an obviousness rejection under 35 U.S.C. 103 of Applicant's claims 2-6, 8-13 and 15-19.

The USPTO acknowledges in the final rejection that Drakesmith et al. does not disclose any of the working compounds recited in claims 2-6, 8-12 and 15-19. Furthermore, there is nothing in the disclosure in Drakesmith et al. that would lead one skilled in the art away from the specific compounds of that patent to those recited in Applicant's claims. The USPTO recognizes this shortcoming in the Drakesmith et al. patent disclosure and, in an erroneous attempt to cure that defect, **takes Official Notice that "changing working fluid is well known in the art."** Such a position by the USPTO is improper and completely erroneous. Applicant, in their response filed May 9, 2005, disputed that this alleged fact is well known in the art and submitted that such a bald allegation is not and cannot be supported by the USPTO. The USPTO has provided no basis for such a contention or any basis for the "official notice". Thus, there cannot be any basis for such official notice to be taken and this contention must be dismissed out-of hand.

Furthermore, even if **"changing working fluid is well known in the art."** that would still not provide any basis, let alone a sound legal or sound factual basis, for a Section 103 rejection for obviousness of claims 2-6, 8-12 and 15-19 since there is no prior art to lead one skilled in the art to select (employ) Applicant's specifically claimed compounds of those claims as working fluids in a Rankine cycle processes. The USPTO has provided no basis for even the existence or properties of these compounds, let alone a basis for selecting them as acceptable working fluids for a Rankine cycle process. The prior art, by itself, without benefit of Applicant's disclosure, must provide the motivation to one skilled in the art to select the specific compounds of Applicant's claims 2, 8 and 15, or those of claims 3, 9 and 16, or that compound of claims 4, 10 and 17, or that compound of claims 5, 11 and 18, or that compound of claims 6, 12 and 19. *In re O'Farrel*, 853 F.2d 894, 7 USPQ2d 1673 (Fed. Cir. 1988). *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed.

Cir. 1991). In the present instance, there is absolutely nothing in the prior art to provide such motivation for the selection of those specific compounds. There is only the erroneous use by the USPTO of the hindsight of Applicant's disclosure to arrive at the compounds of these claims. Such hindsight reconstruction, in an attempt to arrive at Applicant's claimed invention, is without any basis in the prior art and is legally deficient. Thus, the section 103 obviousness rejection is without legal or factual basis and cannot be sustained.

Moreover, nothing in the prior art, provides any basis for use of Applicant's claimed working fluid compounds in a Rankine cycle process that, in addition to being environmentally safe substitutes for the environmentally damaging CFC's and HCFC's, also provide low life cycle climate change potential and low global warming potential, improved heat capacity and thus higher cycle efficiency, as well as high liquid heat capacity, lower heat-to heat capacity ratio, high critical temperature and high thermal stability in addition to low toxicity and improved flammability properties when used as working fluids in a Rankine cycle process. Such improved properties, particularly improved net work output and net power output compared to that obtained with previously employed CFC or HCFC working fluids is illustrated in Examples 1, 2 and 3 and Tables 2, 3 and 4 connected therewith. These unexpectedly improved results from the use of the claimed compound is objective evidence of unobviousness. *In re Papesch*, 315 F.2d 381, 137 USPQ 43, 50 (CCPA 1963). Thus, the prior art is further deficient in failing to provide any basis for a grounds for obviousness of this aspect of Applicant's invention.

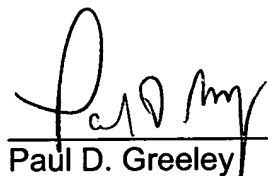
The USPTO has provided no factual basis to support a legally sound basis for an obviousness rejection of the subject matter of claims 2-6, 8-13 and 15-19 and, therefore, the Section 103 rejection of these claims cannot be sustained.

PRAYER FOR RELIEF

Reversal of the Final Rejection of Claims 1-19 and an indication of the patentability of said claims over the reference disclosure is respectfully requested.

Respectfully submitted,

By:



Paul D. Greeley
Reg. No. 31,019
Attorney for Applicant

Ohlandt, Greeley, Ruggiero & Perle, L.L.P.
One Landmark Square, Ninth Floor
Stamford, CT 06901-2682
Tel.: (203) 327-4500
Fax: (203) 327-6401

Date: October 5, 2005

APPENDIX

(9) APPEALED CLAIMS

A copy of the claims on appeal is set forth in this Appendix.

1. (Amended) A process for converting thermal energy to mechanical energy in a Rankine cycle in which a cycle is repeated comprising the steps of vaporizing a working fluid with a heat source, expanding the resulting vapor and then cooling with a cold heat source to condense the vapor, and pressurizing the working fluid, wherein the working fluid comprises a working fluid selected from the group consisting of polyfluorinated ethers, polyfluorinated ketones and mixtures thereof, and wherein the polyfluorinated ethers are not fully halogenated.
2. (Original) A process according to claim 1 wherein the working fluid is selected from the group consisting of methyl (trifluoroethyl) ether ($\text{CH}_3\text{OCH}_2\text{CF}_3$), methyl (heptafluoropropyl) ether ($\text{CH}_3\text{OCF}_2\text{CHF}\text{CF}_3$), di(trifluoroethyl) ether ($\text{CF}_3\text{CH}_2\text{OCH}_2\text{CF}_3$), methyl (hexafluoropropyl) ether ($\text{CH}_3\text{OCF}_2\text{CF}_2\text{CHF}_2$), methyl (pentafluoropropyl) ether ($\text{CH}_3\text{OCH}_2\text{CF}_2\text{CF}_3$), methyl (perfluorobutyl) ether ($\text{C}_4\text{F}_9\text{OCH}_3$), ethyl (perfluorobutyl) ether ($\text{C}_4\text{F}_9\text{OC}_2\text{H}_5$), methyl (perfluoromethyl) ketone (CF_3COCH_3), perfluoromethyl (trifluoroethyl) ketone ($\text{CF}_3\text{CH}_2\text{COCF}_3$), methyl (perfluoroethyl) ketone ($\text{C}_2\text{F}_5\text{COCH}_3$), methyl (perfluoropropyl) ketone ($\text{F}_3\text{CF}_2\text{CF}_2\text{COCH}_3$), perfluoroethyl (perfluoropropyl) ketone ($\text{CF}_3\text{CF}_2\text{CF}_2\text{COC}_2\text{F}_5$), methyl (octafluorobutyl) ketone ($\text{C}_2\text{F}_5\text{CFHCF}_2\text{COCH}_3$), di(perfluoropropyl) ketone ($\text{CF}_3\text{CF}_2\text{CF}_2\text{COCF}_2\text{CF}_2\text{CF}_3$), and mixtures thereof.
3. (Original) A process according to claim 1 wherein the working fluid is selected from the group consisting of methyl (perfluoropropyl) ether, methyl (perfluorobutyl) ether, perfluoroethyl perfluoroisopropyl ketone and mixtures thereof.

4. (Original) A process according to claim 3 wherein the working fluid comprises methyl (perfluoropropyl) ether.
5. (Original) A process according to claim 3 wherein the working fluid comprises methyl (perfluorobutyl) ether.
6. (Original) A process according to claim 3 wherein the working fluid comprises perfluoroethyl perfluoroisopropyl ketone.
7. (Amended) A process for converting thermal energy to mechanical energy which comprises heating a working fluid to a temperature sufficient to vaporize the working fluid and form a pressurized vapor of the working fluid and then causing the pressurized vapor of the working fluid to perform mechanical work, wherein the working fluid comprises a working fluid selected from the group consisting of polyfluorinated ethers, polyfluorinated ketones and mixtures thereof, and wherein the polyfluorinated ethers are not fully halogenated.
8. (Original) A process according to claim 7 wherein the working fluid is selected from the group consisting of methyl (trifluoroethyl) ether ($\text{CH}_3\text{OCH}_2\text{CF}_3$), methyl (heptafluoropropyl) ether ($\text{CH}_3\text{OCF}_2\text{CHF}_2\text{CF}_3$), di(trifluoroethyl) ether ($\text{CF}_3\text{CH}_2\text{OCH}_2\text{CF}_3$), methyl (hexafluoropropyl) ether ($\text{CH}_3\text{OCF}_2\text{CF}_2\text{CHF}_2$), methyl (pentafluoropropyl) ether ($\text{CH}_3\text{OCH}_2\text{CF}_2\text{CF}_3$), methyl (perfluorobutyl) ether ($\text{C}_4\text{F}_9\text{OCH}_3$), ethyl (perfluorobutyl) ether ($\text{C}_4\text{F}_9\text{OC}_2\text{H}_5$), methyl (perfluoromethyl) ketone (CF_3COCH_3), perfluoromethyl (trifluoroethyl) ketone ($\text{CF}_3\text{CH}_2\text{COCF}_3$), methyl (perfluoroethyl) ketone ($\text{C}_2\text{F}_5\text{COCH}_3$), methyl (perfluoropropyl) ketone ($\text{F}_3\text{CF}_2\text{CF}_2\text{COCH}_3$), perfluoroethyl (perfluoropropyl) ketone ($\text{CF}_3\text{CF}_2\text{CF}_2\text{COC}_2\text{F}_5$), methyl (octafluorobutyl) ketone ($\text{C}_2\text{F}_5\text{CFHCF}_2\text{COCH}_3$), di(perfluoropropyl) ketone ($\text{CF}_3\text{CF}_2\text{CF}_2\text{COCF}_2\text{CF}_2\text{CF}_3$), and mixtures thereof.
9. (Original) A process according to claim 7 wherein the working fluid is selected from the group consisting of methyl (perfluoropropyl) ether, methyl (perfluorobutyl) ether, perfluoroethyl perfluoroisopropyl ketone and mixtures thereof.

10. (Original) A process according to claim 9 wherein the working fluid comprises methyl (perfluoropropyl) ether.
11. (Original) A process according to claim 9 wherein the working fluid comprises methyl (perfluorobutyl) ether.
12. (Original) A process according to claim 9 wherein the working fluid comprises perfluoroethyl perfluoroisopropyl ketone.
13. (Original) A process according to claim 7 wherein the pressurized vapor of the working fluid is subsequently cooled below its boiling point and then recycled by again heating the working fluid to again form a pressurized vapor of the working fluid which is then caused to perform additional mechanical work.
14. (Amended) A binary power cycle comprising a primary power cycle and a secondary power cycle, wherein high temperature water vapor is the primary working fluid in the primary power cycle, and a second working fluid is employed in the secondary power cycle to convert thermal energy to mechanical energy and is heated to form a pressurized vapor of the second working fluid and the pressurized vapor of the second working fluid is caused to perform mechanical work, wherein the working fluid comprises a working fluid selected from the group consisting of polyfluorinated ethers, polyfluorinated ketones and mixtures thereof, and wherein the polyfluorinated ethers are not fully halogenated.
15. (Original) A binary power cycle according to claim 14 wherein the working fluid comprises a working fluid selected from the group consisting of methyl (trifluoroethyl) ether ($\text{CH}_3\text{OCH}_2\text{CF}_3$), methyl (heptafluoropropyl) ether ($\text{CH}_3\text{OCF}_2\text{CHF}_2$), di(trifluoroethyl) ether ($\text{CF}_3\text{CH}_2\text{OCH}_2\text{CF}_3$), methyl (hexafluoropropyl) ether ($\text{CH}_3\text{OCF}_2\text{CF}_2\text{CHF}_2$), methyl (pentafluoropropyl) ether ($\text{CH}_3\text{OCH}_2\text{CF}_2\text{CF}_3$), methyl (perfluorobutyl) ether ($\text{C}_4\text{F}_9\text{OCH}_3$), ethyl (perfluorobutyl) ether ($\text{C}_4\text{F}_9\text{OC}_2\text{H}_5$), methyl

(perfluoromethyl) ketone (CF_3COCH_3), perfluoromethyl (trifluoroethyl) ketone ($\text{CF}_3\text{CH}_2\text{COCF}_3$), methyl (perfluoroethyl) ketone ($\text{C}_2\text{F}_5\text{COCH}_3$), methyl (perfluoropropyl) ketone ($\text{F}_3\text{CF}_2\text{CF}_2\text{COCH}_3$), perfluoroethyl (perfluoropropyl) ketone ($\text{CF}_3\text{CF}_2\text{CF}_2\text{COC}_2\text{F}_5$), methyl (octafluorobutyl) ketone ($\text{C}_2\text{F}_5\text{CFHCF}_2\text{COCH}_3$), di(perfluoropropyl) ketone ($\text{CF}_3\text{CF}_2\text{CF}_2\text{COCF}_2\text{CF}_2\text{CF}_3$), and mixtures thereof.

16. (Original) A binary power cycle according to claim 14 wherein the working fluid is selected from the group consisting of methyl (perfluoropropyl) ether, methyl (perfluorobutyl) ether, perfluoroethyl perfluoroisopropyl ketone and mixtures thereof.
17. (Original) A binary power cycle according to claim 15 wherein the working fluid comprises methyl (perfluoropropyl) ether.
18. (Original) A binary power cycle according to claim 15 wherein the working fluid comprises methyl (perfluorobutyl) ether.
19. (Original) A binary power cycle according to claim 15 wherein the working fluid comprises perfluoroethyl perfluoroisopropyl ketone.